Noah Daniel Beelders

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Born: October 2, 1996—Cape Town, South Africa
Nationality: South African

Current position

PhD Student in Applied Probability, Institute for Financial and Actuarial Mathematics, Liverpool

Areas of specialisation

Fluctuation Theory of Lévy Processes

Education

2021-present: PhD in Applied Probability, University of Liverpool

Working Thesis Title: *Fluctuations of Lévy Processes under Poissonian Modifications*

Supervisors: Apostolos Papaioannou, Ehsan Azmoodeh.

Expected Place and Date of Defense: University of Liverpool, November 2025.

2020-2021: Masters in Mathematical Finance, University of Cape Town

Dissertation Title: *A Review of Current Rough Volatility Methods*

Courses: Stochastic Calculus for Finance, Numerical Methods in Finance (MatLab and R), Financial Engineering, Risk Management.

2015-2019: Bachelors of Honours in Actuarial Science, University of Cape Town

Honours Project Title: *Modelling the Return Behaviour of Listed Property, for use in Stochastic Return Models.*

Awards: Class Medal for Statistical Honours Elective Modules.

Talks

07/2025 : Stochastic Processes and their Applications
Topic: Lévy processes under level-dependent Poissonian switching.

05/2025 : Perspectives on Actuarial Risks in Talks of Young Researchers
Topic: Lévy processes under level-dependent Poissonian switching.

12/2024 : FAMiLLY Workshop held at University of York
Topic: Probabilistic Cauchy functional equations.

12/2023 : FAMiLLY Workshop held at University of Liverpool
Topic: Lévy processes under level-dependent Poissonian switching.

Teaching

2021-present: Teaching Assistant at University of Liverpool

MATH362 - Applied Probability. Class size: ≈ 300. Lecturing of solutions to tutorial problems as well as examination marking.

MATH366 - Mathematical Risk Theory. Class size: 60. Lecturing of solutions to tutorial problems.

MATH363 - Linear Statistical Models. Class size: 150. Assisting students with questions during tutorial sessions.

MATH253 - Statistics and Probability 1. Class size: 200. Assisting students with questions during tutorial sessions.

2024: Supervision of Undergraduate Research Project

Job Description: Supervision of a 6-weeks long research project on the Bonus-Malus systems implemented in Saudi Arabia. This also involved teaching the students how to utilise the necessary tools of Markov chains for their analysis.

2018-2021 : Tutor at University of Cape Town

Job Description: Tutoring of masters level course in Numerical Methods in Finance, and tutoring of Honours level course in Financial Economics.

Involvement in South African Actuarial Development Programme (SAADP), tutoring of underprivileged students.

Journal Articles (Published and Unpublished)

[1] E. Azmoodeh, N. Beelders, and Y. Mishura. Probabilistic Cauchy functional equations. *Electron. Commun. Probab.*, 29:Paper No. 61, 12, 2024.

[2] N. Beelders and E. Azmoodeh. A new characterisation of the compound-exponential family of distributions. *Preprint*.

[3] N. Beelders, L. Ramsden, and A. D. Papaioannou. Poissonian potential measures and occupation times for refracted-reflected Lévy processes. *Preprint*.

[4] N. Beelders, L. Ramsden, and A. D. Papaioannou. Lévy processes under level-dependent Poissonian switching. Avaliable at arXiv:2505.00453, 2025.

[5] N. Beelders, L. Ramsden, A. D. Papaioannou, and Z. Palmowski. Exit times for partially stochastically reset Lévy processes. *Preprint*.

Last updated: May 7, 2025